MDOT Michigan Department of Transportation

OFFICE MEMORANDUM

DATE: July 6, 2000

TO: Region Engineers
Region Associate Delivery Engineers
Region Construction Engineers
Resident/Project Engineers/TSC Managers

FROM: C. Thomas Maki
Chief Operations Officer

Gary D. Taylor
Chief Engineer/Deputy Director
Bureau of Highway Technical Services

SUBJECT: Bureau of Highway Instructional Memorandum 2000-12
Compacting Bituminous Mixtures.

The attached Special Provision for Practical Target Density is intended for use on all FY 2000 and future construction projects. This special provision was develop by the MDOT/MAPA QC/QA committee. The purpose of this memo is to explain the intent of the special provision and when it can be applied to a project.

Superpave mixtures are developed to resist rutting and, therefore, are difficult to compact. Contractors have changed their rolling operations to use a variety of roller types including vibratory, pneumatic and static rollers. The intense rolling on pavements with unstable underlying base conditions, could lead to pavement settlement or other types of base failures.

When the contractor is unable to achieve specification density as evidenced by pavement distresses caused by unstable underlying conditions and has demonstrated a significant compactive effort, then a practical target density (PTD) should be established to assure a reasonable compaction effort. A significant compactive effort is when a contractor changes roller patterns, uses different combinations of roller types (pneumatic, two or three wheel static, or vibratory) and adds rollers. The PTD range is from 90 to 92 percent. If the mean pavement density is less than 90 percent, the pavement section should be evaluated for removal and replacement.

The PTD concept can be applied over unstable subgrade areas that are identified prior to or during the paving operation. The project engineer may request documented evidence from the contractor of unstable underlying conditions. These pavement areas usually show evidence of settlement or other types of failure. Examples of possible areas of concerns are shown on the attached.

A thorough review of the contractor=s production and paving operations, as well as the mixture quality, should be reviewed before changing the specified pavement density requirements. A punch list of review parameters is also attached.

It is intended that the PTD be applied to significant lengths of pavement meeting the requirements of the special provision. Short sections of pavement areas, less than 100 m, showing distress due to compaction should be evaluated and any cores that fall in these areas may be taken out of the lot average for density payment.

As stated in the special provision, no additional compensation will be paid for applying the PTD, and when used the pavement area affected will not be eligible for density incentives or penalties. The special provision can be inserted into active construction projects by contract modification where appropriate.

If you have any further questions, please contact Mike Frankhouse at 517-322-5672.

Chief Operations Officer

Chief Engineer/Deputy Director
Bureau of Highway Technical Services

BOHTS:C/T:MF:kab
Subject Index: Bituminous
Attachments

cc: C & T Division
Real Estate Division, M. Frierson
Design Division, P. Miller
Maintenance Division, C. Roberts
Traffic& Safety Division, J. O=Doherty
C & T Division, J. Culp
OEO - A. Suber
J. Klee
R. Knapp
V. Blaxton
B. Jay
K. Trentham
MRBA
MAPA
MCPA
MCA
MAA
AUC
CRAM
MRPA
FHWA

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
PRACTICAL TARGET DENSITY

a. Description. If an area of inadequate base conditions is shown on the plans (may be identified by exclusion of vibratory rollers), or identified by the Contractor prior to or during the paving operation, a 50 meter control strip may be paved to establish the practical target density for the area. It is the Contractor=s responsibility to immediately contact the project engineer and provide evidence of inadequate base conditions in areas not shown on the plans. The Engineer must concur with the Contractor=s findings and agree to the limits of each area.

b. Materials. The Control strip will be constructed using the bituminous mixture specified for the project.

c. Construction. The Contractor will pave a 50 meter control strip full width over each area of inadequate base conditions and compact the control strip with a roller pattern that is acceptable to the Engineer. After compaction, the Engineer will lay out six randomly selected core locations within the control strip. The Contractor will take the cores and the Engineer will test them. The mean density of the six cores from the control strip will be the target density for the remainder of the area. The rolling pattern established on the control strip will be used for the entire area.

If the mean density of the six cores is less than 90% of G_{mm}, the Engineer will evaluate the entire pavement section within the area for acceptance or for an alternative action. This alternative action may include removal and replacement of the pavement section.

d. Measurement and Payment. No additional payment will be made for constructing and coring the control strip. If the proposal includes a special provision for furnishing and placing bituminous mixture, pavement areas that use a practical target density established by a control strip are not eligible for pavement density Bituminous Quality Initiative nor are they subject to a negative adjustment to the contract unit price for Bituminous Mixture, as specified in that provision.

04/21/00

Punch list for Practical Target Density (PTD)

1. Check bituminous mixture QC/QA testing for changes in volumetric properties within the last few sublots of production.

2. Review test documentation and check for J.M.F. changes or deviation from the mix design and conformance to superpave specifications.

3. Check the lift thickness of the mat.

4. Check paving and rolling operations for any changes.

5. Check rollers (size, type, vibratory settings, passes, etc.).

6. Check mat temperatures during rolling operations.

7. Check and compare pavement design to actual construction for any discrepancies.

Possible areas of Concern

1. Swamp backfill areas, areas adjacent to wetlands.

2. High water tables, areas such as in vertical sag curves.

3. Bridge underclearance reconstruction.

4. Insufficient base under shoulders.

5. Culvert locations.

6. Utility construction.

7. Deteriorated concrete pavement.